



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/733,702	12/11/2003	Michael A. Fetcenko	HS-115	8674
24963	7590	03/06/2006		
ENERGY CONVERSION DEVICES, INC. 2956 WATerview DRIVE ROCHESTER HILLS, MI 48309			EXAMINER NGUYEN, CAM N	
			ART UNIT	PAPER NUMBER
			1754	
DATE MAILED: 03/06/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/733,702

Applicant(s)

FETCENKO ET AL.

Examiner

Cam N. Nguyen

Art Unit

1754

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12/12/05 (an amendment/response).
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 22-31 is/are allowed.
- 6) ☒ Claim(s) 1-20 and 34 is/are rejected.
- 7) ☒ Claim(s) 17-18, 21, & 32-34 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on originally filed is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### **Response to Amendment**

1. Applicants' amendment and remarks, filed December 12, 2005, has been made of record and entered. Claim 1 has been amended.

Claims 1-34 are currently pending and under consideration.

### **Claim Objections**

2. Claims 17-18, 21, & 32-34 are objected to because of the following informalities:
  - A. In claims 17, 18, 32, & 33, line 2, --selected-- should be inserted before "from".
  - B. In claim 21, line 3, "a both" should be changed to --both--.
  - C. In claim 34, line 2, "created by the steps of" is suggested changed to --prepared by a process comprises the steps of:--
  - D. In claim 34, line 8, "for a powder" should be changed to --form a powder--.

Appropriate correction is required.

### **Claim Rejections - 35 USC § 112 (Second Paragraph)**

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claim 34 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Art Unit: 1754

- A. Regarding claim 34, line 3, the phrase "desired composition" is unclear as to what composition is intended. Thus, it renders the claim vague and indefinite.
- B. Claim 34 recites the limitation "said melt-quenching parameters" in line 5. There is insufficient antecedent basis for this limitation in the claim.
- C. Regarding claim 34, line 7, the phrase "an attritor to for a sufficient time to:" is unclear as to what applicants intend. Thus, renders the claim vague and indefinite.

**Claim Rejections - 35 USC § 102(b)**

- 5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

- 6. Claims 1-7, 12, & 17-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Kawakami (US Pat. 6,040,087).

Kawakami discloses a powdery material having a function of storing and releasing hydrogen, comprising a compound which electrochemically stores and releases hydrogen, said powdery material having a structure of at least three layers comprising: a core of a hydrogen-storing alloy; a metal oxide layer provided on the surface of said core and having a function of preventing the oxidation of the alloy and allowing atomic hydrogen or hydrogen ions to pass therethrough; and a metal element dispersed on the surface of said metal oxide layer and having a function of activating hydrogen (see col. 40, claim 1). The metal oxide layer comprises at least one transition

Art Unit: 1754

metal element selected from the group including molybdenum, tungsten, vanadium, niobium, titanium, zirconium and iridium (see col. 40, claim 2). The metal element dispersed on the surface of said metal oxide layer is at least one transition metal element selected from a group including nickel, chromium, molybdenum, cobalt, copper, palladium, platinum, iron, ruthenium, rhodium, iridium, tungsten, titanium and manganese (see col. 40, claim 3). The hydrogen-storing core layer comprises an alloy of nickel and magnesium (see col. 40, claim 4). Kawakami further discloses that a part of magnesium in the hydrogen-storing core layer composed of the alloy of nickel and magnesium is replaced with at least one element selected from the group consisting of titanium, beryllium, aluminum, manganese, zinc, chromium, iron, indium, cobalt, molybdenum, tin, lead, antimony, bismuth, copper, silver, palladium and platinum (see col. 41, claim 6). See also col. 12, ln 3-11. The thickness of the layer in which the transition metal is dispersed is preferably not less than 1 nm and not more than 30 nm (equivalent to 10-300 Angstroms) and more preferably, not less than 5 nm and not more than 10 nm (see col. 12, ln. 14-19).

Kawakami discloses the claimed hydrogen storage composite material, thus anticipates the claims.

Regarding the limitation on "said composite material capable of adsorbing at least 3 weight percent hydrogen and desorbing at least 1 weight percent hydrogen at 30°C", it is inherent that the disclosed powdery material would have the same capability since the material is the same as being claimed.

The claimed coating thickness is met by the teaching of the reference since it

falls within the disclosed range (see above).

**Claim Rejections - 35 USC § 103**

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 8-11 & 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawakami (US Pat. 6,040,087), as applied to claims 1-7, 12, 17-20 above, and further in view of Sapru et al., "hereinafter Sapru", (US Pat. 6,103,024).

Kawakami discloses a powdery material as described above, except for the following differences.

Kawakami does not disclose the claimed Mg, Ni, manganese, and cobalt contents. It would have been *prima facie obvious* to one of ordinary skill in the art at the time the invention was made to have predetermined the optimum amount for Mg and Ni in order to achieve an effective alloy in view of *In re Boesch*, because it involves only routine experimentation of one having the ordinary skill in the art to do so.

Also, it would have been *prima facie obvious* to one of ordinary skill in the art at the time the invention was made to have utilized the manganese and cobalt at the amounts as suggested by Sapru to result in an effective alloy because it is known and taught by Sapru. Specifically, Sapru discloses a hydrogen storage alloy material containing Mg, Ni, Mo, and at least one additional element selected from the group

Art Unit: 1754

consisting of Al, C, Ca, Ce, Co, Cr, Cu, Dy, Fe, La, Mn, Nd, Si, Ti, V, and Zr (see Sapru at col. 9- col. 10, claim 1), wherein the amount of the additional element is in the range of 1-15 atomic % (see Sapru at col. 10, claim 2). Note that the claimed manganese, cobalt, and the additional metal amounts fall within the claimed range.

**Allowable Subject Matter**

9. Claims 21-34 are allowable because they contain allowable subject matter. The following is a statement of reasons for the indication of allowable subject matter:

The prior art does not disclose or fairly suggest a hydrogen storage alloy comprising an Mg-Ni based alloy having a microstructure including both a Mg-rich phase and a Ni-rich phase and further including micro-tubes having an inner core of Ni-rich material surrounded by a sheathing of Mg-rich material (as recited in claim 21).

There is no motivation to combine the teachings of the references together.

**Response to Applicants' Arguments**

10. Applicants' amendment and remarks filed on December 12, 2005 has been considered, but not deemed persuasive in view of the new ground of rejections above and the following reasons.

Applicants urged, that catalytic coating disclosed by the '087 patent is not in contact with the magnesium material directly is noted. Regarding claims 1-4 & 8-20, it is considered the catalytic coating of the '087 patent is directly contacting with the alloy material since Kawakami '087 discloses "iridium" as a suitable metal oxide layer

Art Unit: 1754

component (see Kawakami at col. 40, claim 2). Note that “iridium” is also disclosed as a suitable metal component for the metal element dispersed on the surface of the metal oxide layer (see Kawakami at col. 40, claim 3). Regarding claims 5-7, it is considered the disclosed “intermediate material” or “metal oxide layer” disclosed by the Kawakami reference does not appear to distinguish from the claimed composite material due to the open-ended phrase “comprising” in the preamble of claim 1.

Applicants’ further urging on the “storage capacity and thermodynamics” is noted. First, it is considered the instant claim 1 does not require that the limitation on “capable of adsorbing and desorbing hydrogen...” be part of the properties of the claimed composite material, but it is regarded as an intended use limitation. Second, it is considered the disclosed composite material would inherently capable of performing or function the same as being claimed since the material is the same.

### **Conclusion**

11. Claims 1-34 are pending. Claims 1-20 & 34 are rejected. Claims 17-18, 21, & 32-34 are objected. Claims 22-31 are allowed.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Primary Examiner Cam N Nguyen, whose telephone number is 571-272-1357. The examiner can normally be reached on M, W, R, & F, 9:00 AM - 6:30 PM.




Art Unit: 1754

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman, can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nguyen/cnn  
March 01, 2006



  
CAM N. NGUYEN  
PRIMARY EXAMINER

Art Unit - 1754